REMARKS

Prior to an examination of the present application, Applicants respectfully request entry of this Preliminary Amendment.

The title of the invention has been amended.

By this Preliminary Amendment, various editorial amendments have been made to the specification. No new matter has been added.

Also, a substitute abstract along with a marked-up substitute abstract is enclosed herewith.

By this Preliminary Amendment, claims 1-12 have been canceled without prejudice or disclaimer to the subject matter therein and new claims 13-32 have been added.

In addition, corrected drawings for Figs. 1, 11, 16, 20, 23, and 24 are filed herewith under a separate cover letter. In the corrected drawings various editorial amendments have been made. Due to the nature and number of changes, marked-up versions of the amended figures are enclosed in order to provide an explanation of the amendments.

Respectfully submitted,

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Version with Markings to
Show Changes Made

ABSTRACT

~~In a high-frequency signal level detection apparatus for detecting an inputted signal level of a high-frequency signal, an AGC circuit 31 executes an automatic gain control on an intermediate frequency signal obtained by converting a frequency of a received high-frequency signal, using an RFAGC value for controlling a gain of the high-frequency signal and an IFAGC value for controlling a gain of the intermediate frequency signal based on the intermediate frequency signal so that an output level of the intermediate frequency signal is substantially constant. A controller 50 previously measures first relational data indicating an RFAGC value relative to the inputted signal level of the received high-frequency signal and second relational data indicating an IFAGC value relative to the inputted signal level of the received high-frequency signal, measures the RFAGC value and the IFAGC value when a high-frequency signal to be measured is received, and detects the inputted signal level of the received high-frequency signal using the measured first and second relational data based on the measured RFAGC value and IFAGC value.~~

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Fig.1

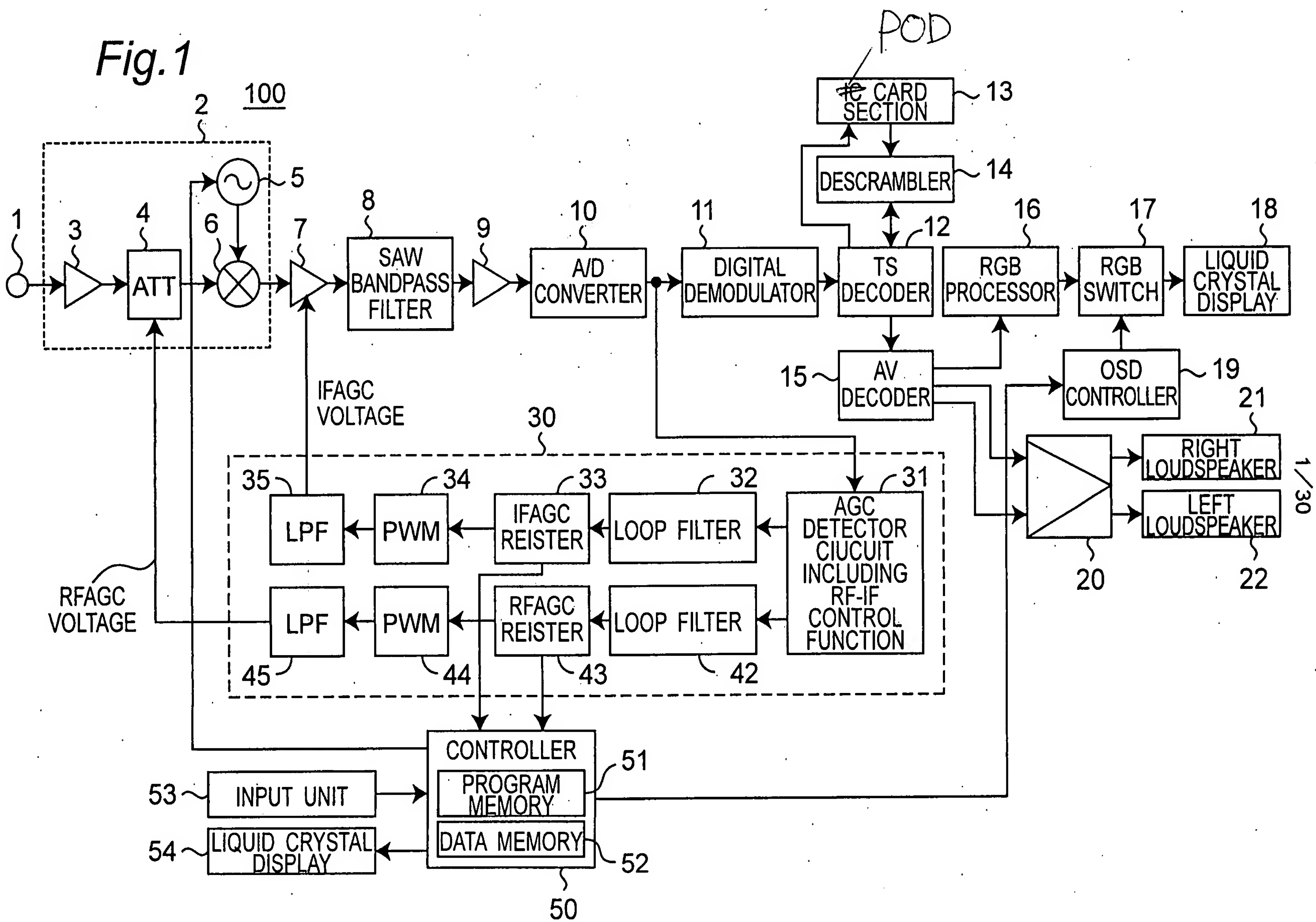

100
1
2
3
4
ATT
5
6
7
8
SAW BANDPASS FILTER
9
10
A/D CONVERTER
11
DIGITAL DEMODULATOR
12
TS DECODER
13
POD
~~IC~~ CARD SECTION
14
DESCRAMBLER
15
AV DECODER
16
RGB PROCESSOR
17
RGB SWITCH
18
LIQUID CRYSTAL DISPLAY
19
OSD CONTROLLER
20
21
RIGHT LOUDSPEAKER
22
LEFT LOUDSPEAKER
1/30
IFAGC VOLTAGE
RFAGC VOLTAGE
30
31
AGC DETECTOR CIUCUIT INCLUDING RF-IF CONTROL FUNCTION
32
LOOP FILTER
33
IFAGC REISTER
34
PWM
35
LPF
42
LOOP FILTER
43
RFAGC REISTER
44
PWM
45
LPF
50
CONTROLLER
51
PROGRAM MEMORY
52
DATA MEMORY
53
INPUT UNIT
54
LIQUID CRYSTAL DISPLAY

Fig.11

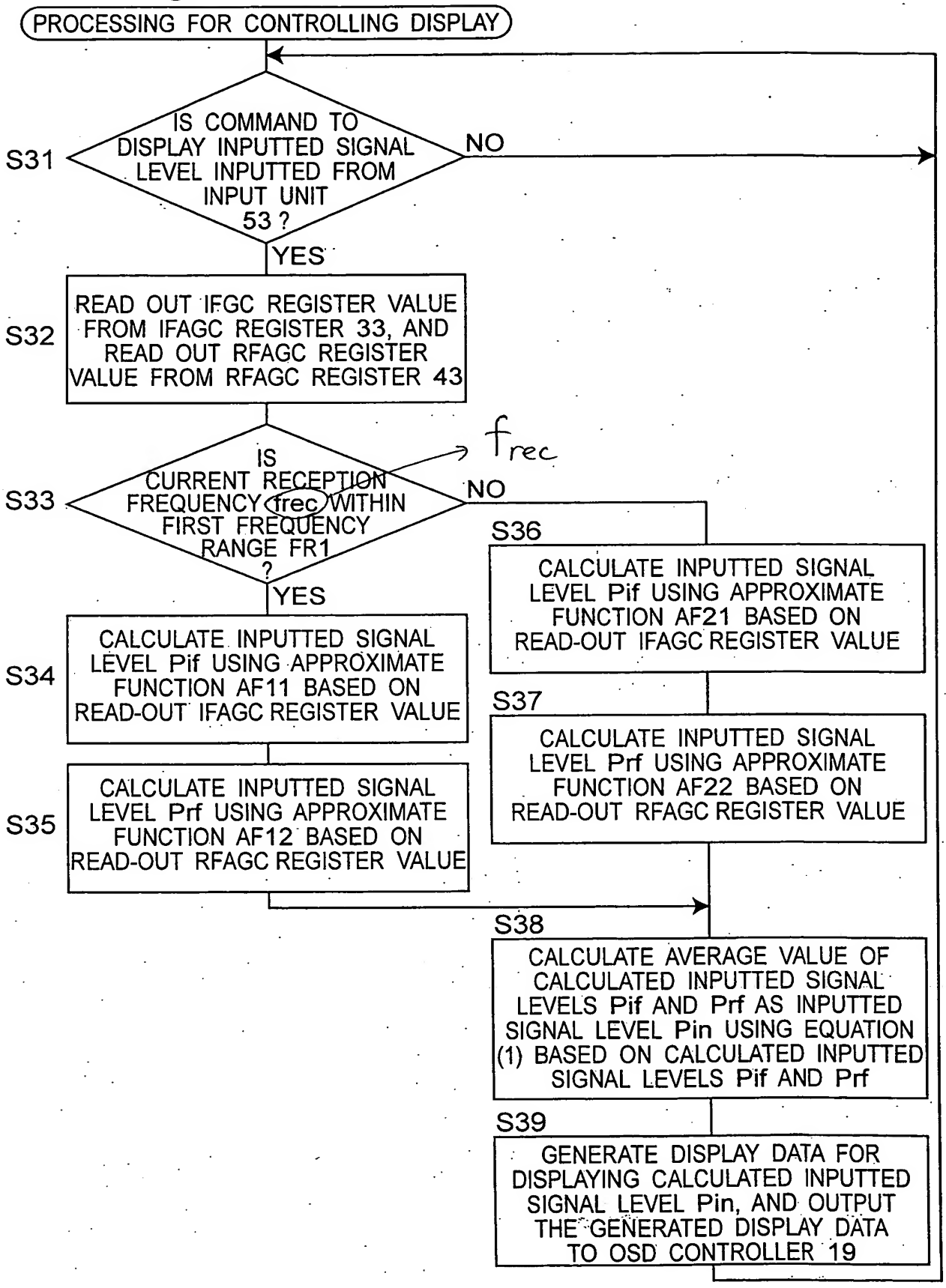

PROCESSING FOR CONTROLLING DISPLAY
S31
IS COMMAND TO DISPLAY INPUTTED SIGNAL LEVEL INPUTTED FROM INPUT UNIT 53 ?
NO
YES
S32
READ OUT IFGC REGISTER VALUE FROM IFAGC REGISTER 33, AND READ OUT RFAGC REGISTER VALUE FROM RFAGC REGISTER 43
S33
IS CURRENT RECEPTION FREQUENCY frec WITHIN FIRST FREQUENCY RANGE FR1 ?
frec
NO
YES
S34
CALCULATE INPUTTED SIGNAL LEVEL Pif USING APPROXIMATE FUNCTION AF11 BASED ON READ-OUT IFAGC REGISTER VALUE
S35
CALCULATE INPUTTED SIGNAL LEVEL Prf USING APPROXIMATE FUNCTION AF12 BASED ON READ-OUT RFAGC REGISTER VALUE
S36
CALCULATE INPUTTED SIGNAL LEVEL Pif USING APPROXIMATE FUNCTION AF21 BASED ON READ-OUT IFAGC REGISTER VALUE
S37
CALCULATE INPUTTED SIGNAL LEVEL Prf USING APPROXIMATE FUNCTION AF22 BASED ON READ-OUT RFAGC REGISTER VALUE
S38
CALCULATE AVERAGE VALUE OF CALCULATED INPUTTED SIGNAL LEVELS Pif AND Prf AS INPUTTED SIGNAL LEVEL Pin USING EQUATION (1) BASED ON CALCULATED INPUTTED SIGNAL LEVELS Pif AND Prf
S39
GENERATE DISPLAY DATA FOR DISPLAYING CALCULATED INPUTTED SIGNAL LEVEL Pin, AND OUTPUT THE GENERATED DISPLAY DATA TO OSD CONTROLLER 19

Fig.16

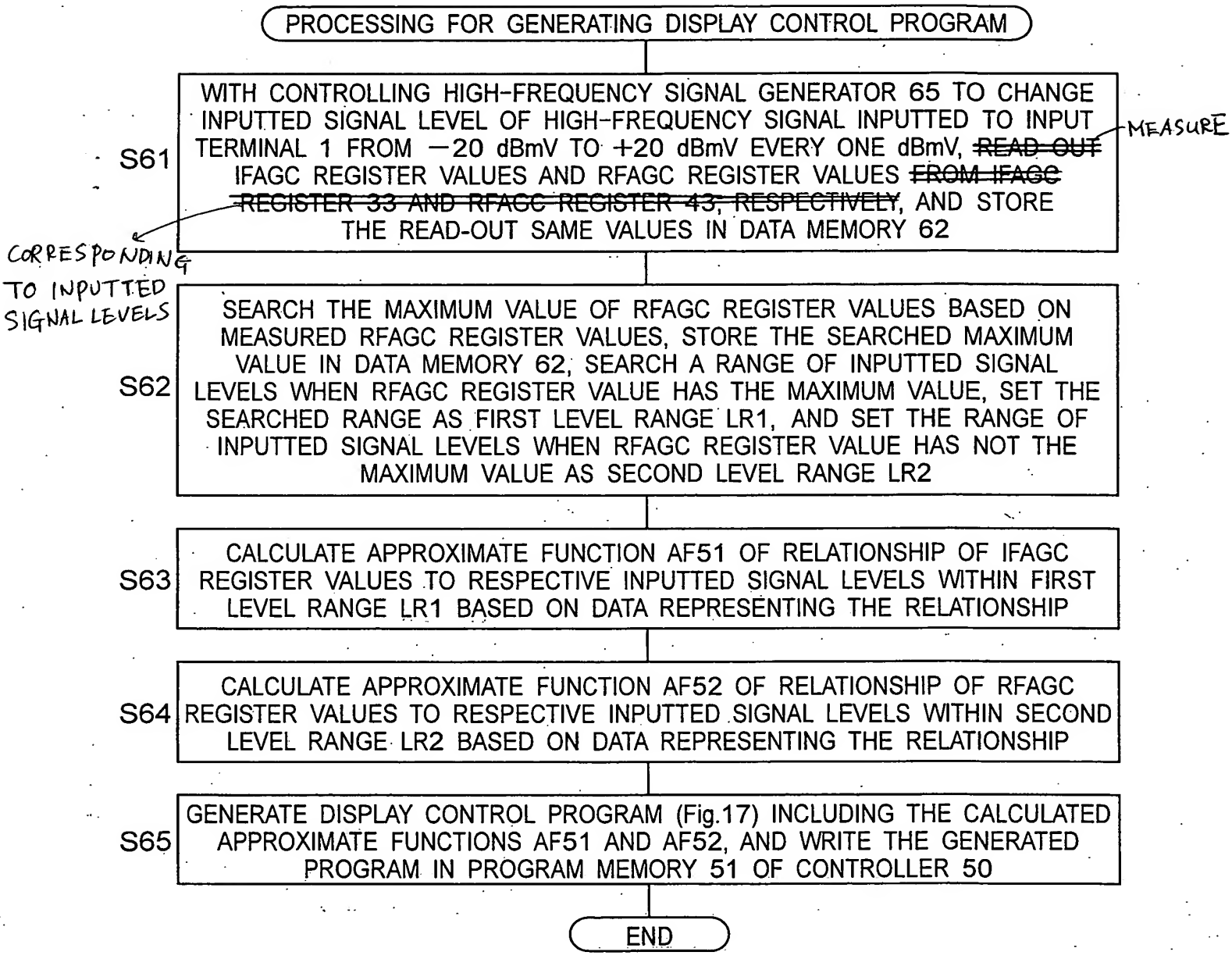

PROCESSING FOR GENERATING DISPLAY CONTROL PROGRAM
S61
WITH CONTROLLING HIGH-FREQUENCY SIGNAL GENERATOR 65 TO CHANGE INPUTTED SIGNAL LEVEL OF HIGH-FREQUENCY SIGNAL INPUTTED TO INPUT TERMINAL 1 FROM −20 dBmV TO +20 dBmV EVERY ONE dBmV, READ-OUT IFAGC REGISTER VALUES AND RFAGC REGISTER VALUES FROM IFAGC REGISTER 33 AND RFAGC REGISTER 43, RESPECTIVELY, AND STORE THE READ-OUT SAME VALUES IN DATA MEMORY 62
MEASURE
CORRESPONDING TO INPUTTED SIGNAL LEVELS
S62
SEARCH THE MAXIMUM VALUE OF RFAGC REGISTER VALUES BASED ON MEASURED RFAGC REGISTER VALUES, STORE THE SEARCHED MAXIMUM VALUE IN DATA MEMORY 62, SEARCH A RANGE OF INPUTTED SIGNAL LEVELS WHEN RFAGC REGISTER VALUE HAS THE MAXIMUM VALUE, SET THE SEARCHED RANGE AS FIRST LEVEL RANGE LR1, AND SET THE RANGE OF INPUTTED SIGNAL LEVELS WHEN RFAGC REGISTER VALUE HAS NOT THE MAXIMUM VALUE AS SECOND LEVEL RANGE LR2
S63
CALCULATE APPROXIMATE FUNCTION AF51 OF RELATIONSHIP OF IFAGC REGISTER VALUES TO RESPECTIVE INPUTTED SIGNAL LEVELS WITHIN FIRST LEVEL RANGE LR1 BASED ON DATA REPRESENTING THE RELATIONSHIP
S64
CALCULATE APPROXIMATE FUNCTION AF52 OF RELATIONSHIP OF RFAGC REGISTER VALUES TO RESPECTIVE INPUTTED SIGNAL LEVELS WITHIN SECOND LEVEL RANGE LR2 BASED ON DATA REPRESENTING THE RELATIONSHIP
S65
GENERATE DISPLAY CONTROL PROGRAM (Fig.17) INCLUDING THE CALCULATED APPROXIMATE FUNCTIONS AF51 AND AF52, AND WRITE THE GENERATED PROGRAM IN PROGRAM MEMORY 51 OF CONTROLLER 50
END

Fig.20

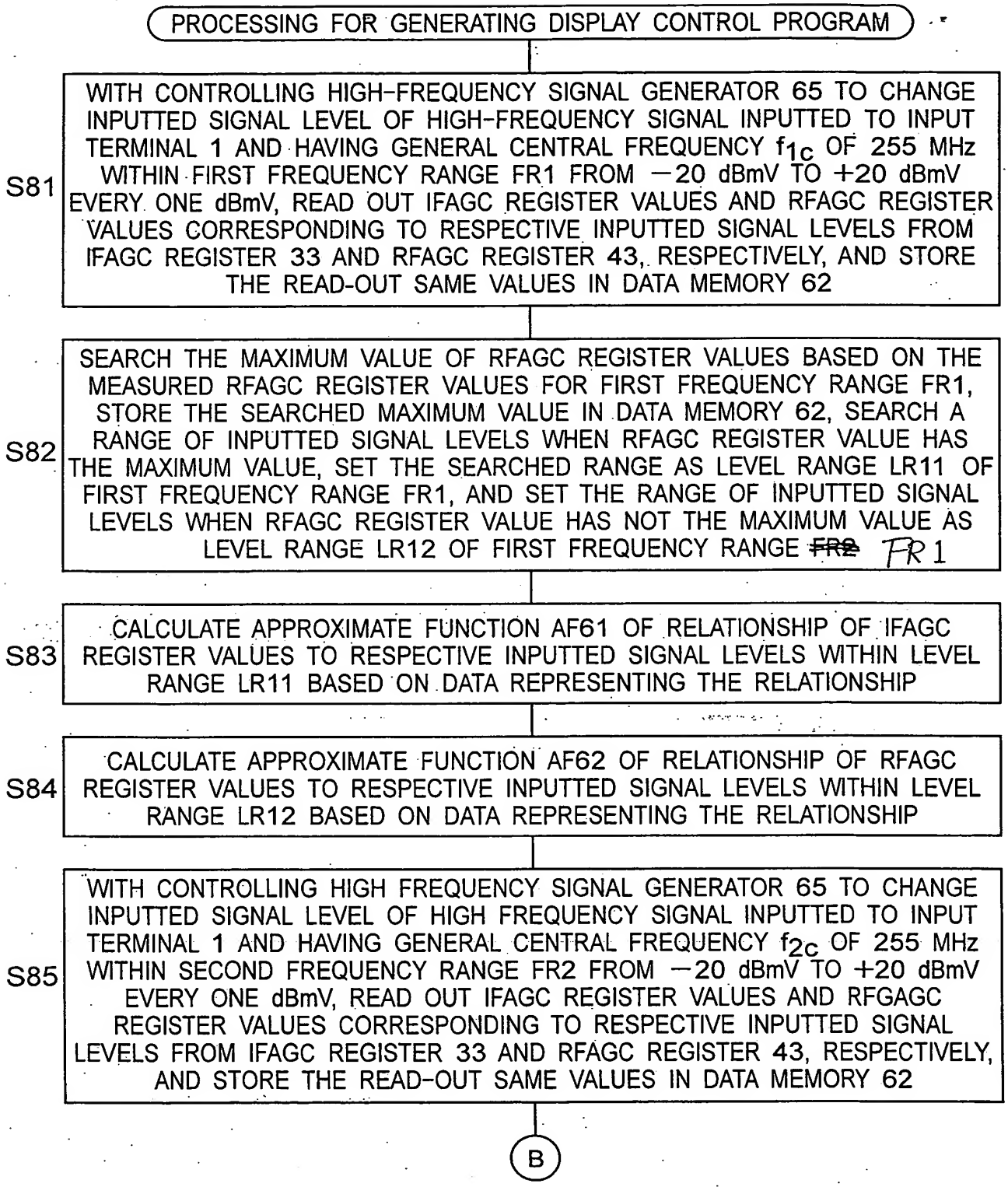

PROCESSING FOR GENERATING DISPLAY CONTROL PROGRAM
S81
WITH CONTROLLING HIGH-FREQUENCY SIGNAL GENERATOR 65 TO CHANGE INPUTTED SIGNAL LEVEL OF HIGH-FREQUENCY SIGNAL INPUTTED TO INPUT TERMINAL 1 AND HAVING GENERAL CENTRAL FREQUENCY f_{1c} OF 255 MHz WITHIN FIRST FREQUENCY RANGE FR1 FROM −20 dBmV TO +20 dBmV EVERY ONE dBmV, READ OUT IFAGC REGISTER VALUES AND RFAGC REGISTER VALUES CORRESPONDING TO RESPECTIVE INPUTTED SIGNAL LEVELS FROM IFAGC REGISTER 33 AND RFAGC REGISTER 43, RESPECTIVELY, AND STORE THE READ-OUT SAME VALUES IN DATA MEMORY 62
S82
SEARCH THE MAXIMUM VALUE OF RFAGC REGISTER VALUES BASED ON THE MEASURED RFAGC REGISTER VALUES FOR FIRST FREQUENCY RANGE FR1, STORE THE SEARCHED MAXIMUM VALUE IN DATA MEMORY 62, SEARCH A RANGE OF INPUTTED SIGNAL LEVELS WHEN RFAGC REGISTER VALUE HAS THE MAXIMUM VALUE, SET THE SEARCHED RANGE AS LEVEL RANGE LR11 OF FIRST FREQUENCY RANGE FR1, AND SET THE RANGE OF INPUTTED SIGNAL LEVELS WHEN RFAGC REGISTER VALUE HAS NOT THE MAXIMUM VALUE AS LEVEL RANGE LR12 OF FIRST FREQUENCY RANGE ~~FR2~~ FR1
S83
CALCULATE APPROXIMATE FUNCTION AF61 OF RELATIONSHIP OF IFAGC REGISTER VALUES TO RESPECTIVE INPUTTED SIGNAL LEVELS WITHIN LEVEL RANGE LR11 BASED ON DATA REPRESENTING THE RELATIONSHIP
S84
CALCULATE APPROXIMATE FUNCTION AF62 OF RELATIONSHIP OF RFAGC REGISTER VALUES TO RESPECTIVE INPUTTED SIGNAL LEVELS WITHIN LEVEL RANGE LR12 BASED ON DATA REPRESENTING THE RELATIONSHIP
S85
WITH CONTROLLING HIGH FREQUENCY SIGNAL GENERATOR 65 TO CHANGE INPUTTED SIGNAL LEVEL OF HIGH FREQUENCY SIGNAL INPUTTED TO INPUT TERMINAL 1 AND HAVING GENERAL CENTRAL FREQUENCY f_{2c} OF 255 MHz WITHIN SECOND FREQUENCY RANGE FR2 FROM −20 dBmV TO +20 dBmV EVERY ONE dBmV, READ OUT IFAGC REGISTER VALUES AND RFGAGC REGISTER VALUES CORRESPONDING TO RESPECTIVE INPUTTED SIGNAL LEVELS FROM IFAGC REGISTER 33 AND RFAGC REGISTER 43, RESPECTIVELY, AND STORE THE READ-OUT SAME VALUES IN DATA MEMORY 62
B

Fig.23

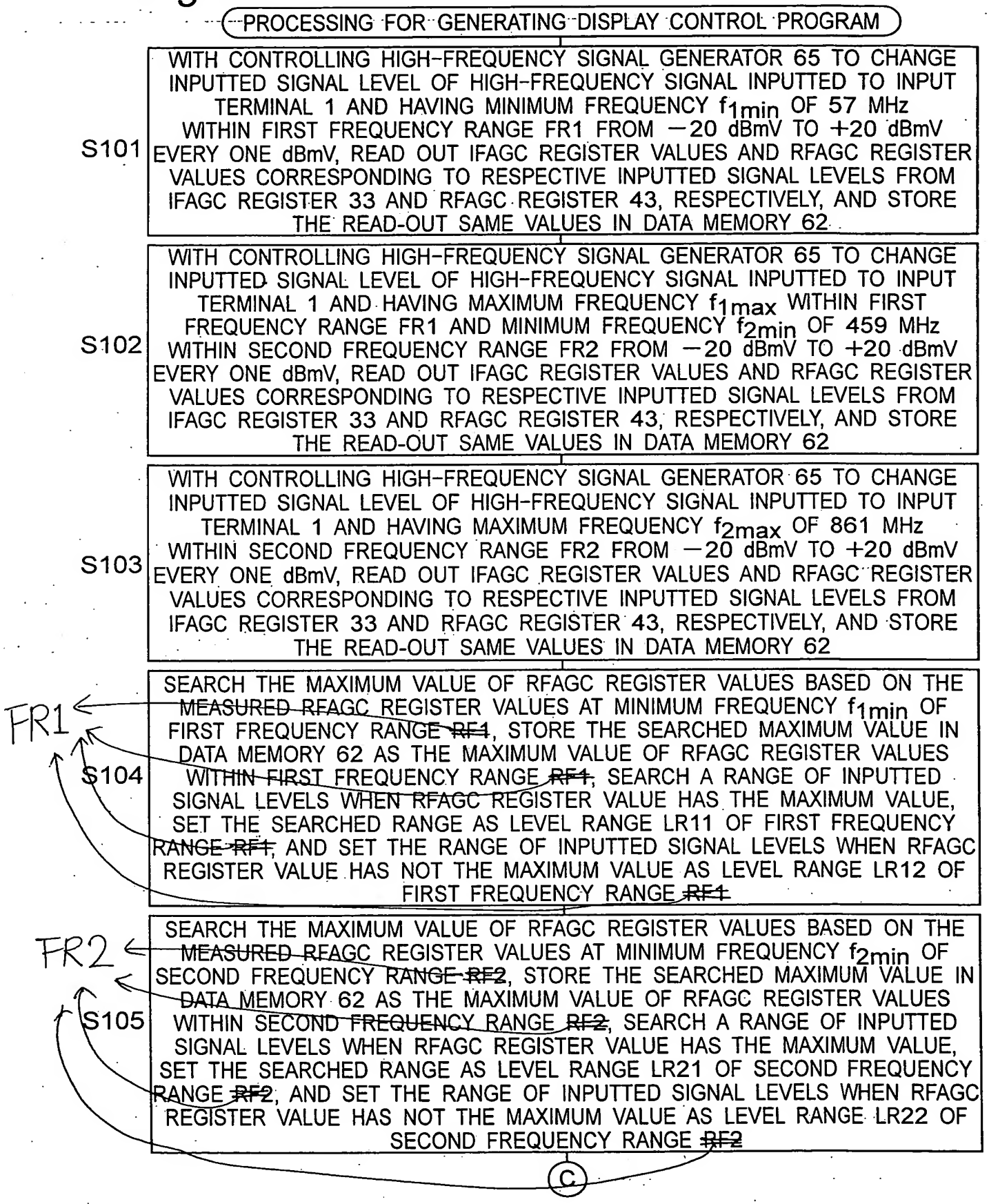
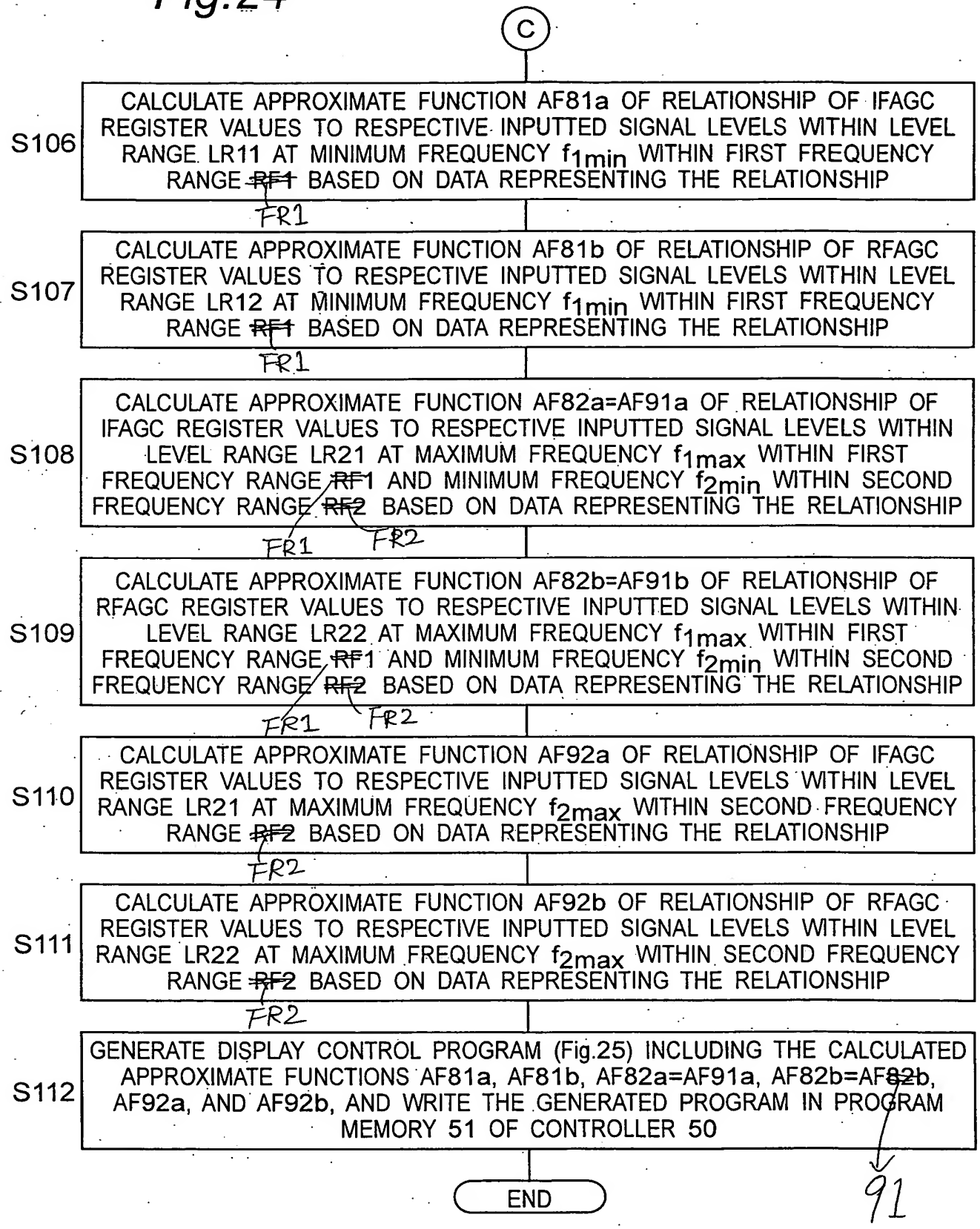

PROCESSING FOR GENERATING DISPLAY CONTROL PROGRAM
S101
WITH CONTROLLING HIGH-FREQUENCY SIGNAL GENERATOR 65 TO CHANGE INPUTTED SIGNAL LEVEL OF HIGH-FREQUENCY SIGNAL INPUTTED TO INPUT TERMINAL 1 AND HAVING MINIMUM FREQUENCY f_{1min} OF 57 MHz WITHIN FIRST FREQUENCY RANGE FR1 FROM −20 dBmV TO +20 dBmV EVERY ONE dBmV, READ OUT IFAGC REGISTER VALUES AND RFAGC REGISTER VALUES CORRESPONDING TO RESPECTIVE INPUTTED SIGNAL LEVELS FROM IFAGC REGISTER 33 AND RFAGC REGISTER 43, RESPECTIVELY, AND STORE THE READ-OUT SAME VALUES IN DATA MEMORY 62
S102
WITH CONTROLLING HIGH-FREQUENCY SIGNAL GENERATOR 65 TO CHANGE INPUTTED SIGNAL LEVEL OF HIGH-FREQUENCY SIGNAL INPUTTED TO INPUT TERMINAL 1 AND HAVING MAXIMUM FREQUENCY f_{1max} WITHIN FIRST FREQUENCY RANGE FR1 AND MINIMUM FREQUENCY f_{2min} OF 459 MHz WITHIN SECOND FREQUENCY RANGE FR2 FROM −20 dBmV TO +20 dBmV EVERY ONE dBmV, READ OUT IFAGC REGISTER VALUES AND RFAGC REGISTER VALUES CORRESPONDING TO RESPECTIVE INPUTTED SIGNAL LEVELS FROM IFAGC REGISTER 33 AND RFAGC REGISTER 43, RESPECTIVELY, AND STORE THE READ-OUT SAME VALUES IN DATA MEMORY 62
S103
WITH CONTROLLING HIGH-FREQUENCY SIGNAL GENERATOR 65 TO CHANGE INPUTTED SIGNAL LEVEL OF HIGH-FREQUENCY SIGNAL INPUTTED TO INPUT TERMINAL 1 AND HAVING MAXIMUM FREQUENCY f_{2max} OF 861 MHz WITHIN SECOND FREQUENCY RANGE FR2 FROM −20 dBmV TO +20 dBmV EVERY ONE dBmV, READ OUT IFAGC REGISTER VALUES AND RFAGC REGISTER VALUES CORRESPONDING TO RESPECTIVE INPUTTED SIGNAL LEVELS FROM IFAGC REGISTER 33 AND RFAGC REGISTER 43, RESPECTIVELY, AND STORE THE READ-OUT SAME VALUES IN DATA MEMORY 62
FR1
S104
SEARCH THE MAXIMUM VALUE OF RFAGC REGISTER VALUES BASED ON THE MEASURED RFAGC REGISTER VALUES AT MINIMUM FREQUENCY f_{1min} OF FIRST FREQUENCY RANGE RF1, STORE THE SEARCHED MAXIMUM VALUE IN DATA MEMORY 62 AS THE MAXIMUM VALUE OF RFAGC REGISTER VALUES WITHIN FIRST FREQUENCY RANGE RF1, SEARCH A RANGE OF INPUTTED SIGNAL LEVELS WHEN RFAGC REGISTER VALUE HAS THE MAXIMUM VALUE, SET THE SEARCHED RANGE AS LEVEL RANGE LR11 OF FIRST FREQUENCY RANGE RF1, AND SET THE RANGE OF INPUTTED SIGNAL LEVELS WHEN RFAGC REGISTER VALUE HAS NOT THE MAXIMUM VALUE AS LEVEL RANGE LR12 OF FIRST FREQUENCY RANGE RF1
FR2
S105
SEARCH THE MAXIMUM VALUE OF RFAGC REGISTER VALUES BASED ON THE MEASURED RFAGC REGISTER VALUES AT MINIMUM FREQUENCY f_{2min} OF SECOND FREQUENCY RANGE RF2, STORE THE SEARCHED MAXIMUM VALUE IN DATA MEMORY 62 AS THE MAXIMUM VALUE OF RFAGC REGISTER VALUES WITHIN SECOND FREQUENCY RANGE RF2, SEARCH A RANGE OF INPUTTED SIGNAL LEVELS WHEN RFAGC REGISTER VALUE HAS THE MAXIMUM VALUE, SET THE SEARCHED RANGE AS LEVEL RANGE LR21 OF SECOND FREQUENCY RANGE RF2, AND SET THE RANGE OF INPUTTED SIGNAL LEVELS WHEN RFAGC REGISTER VALUE HAS NOT THE MAXIMUM VALUE AS LEVEL RANGE LR22 OF SECOND FREQUENCY RANGE RF2
C

Fig.24


C
S106
CALCULATE APPROXIMATE FUNCTION AF81a OF RELATIONSHIP OF IFAGC REGISTER VALUES TO RESPECTIVE INPUTTED SIGNAL LEVELS WITHIN LEVEL RANGE LR11 AT MINIMUM FREQUENCY f_{1min} WITHIN FIRST FREQUENCY RANGE ~~RF1~~ FR1 BASED ON DATA REPRESENTING THE RELATIONSHIP
S107
CALCULATE APPROXIMATE FUNCTION AF81b OF RELATIONSHIP OF RFAGC REGISTER VALUES TO RESPECTIVE INPUTTED SIGNAL LEVELS WITHIN LEVEL RANGE LR12 AT MINIMUM FREQUENCY f_{1min} WITHIN FIRST FREQUENCY RANGE ~~RF1~~ FR1 BASED ON DATA REPRESENTING THE RELATIONSHIP
S108
CALCULATE APPROXIMATE FUNCTION AF82a=AF91a OF RELATIONSHIP OF IFAGC REGISTER VALUES TO RESPECTIVE INPUTTED SIGNAL LEVELS WITHIN LEVEL RANGE LR21 AT MAXIMUM FREQUENCY f_{1max} WITHIN FIRST FREQUENCY RANGE ~~RF1~~ FR1 AND MINIMUM FREQUENCY f_{2min} WITHIN SECOND FREQUENCY RANGE ~~RF2~~ FR2 BASED ON DATA REPRESENTING THE RELATIONSHIP
S109
CALCULATE APPROXIMATE FUNCTION AF82b=AF91b OF RELATIONSHIP OF RFAGC REGISTER VALUES TO RESPECTIVE INPUTTED SIGNAL LEVELS WITHIN LEVEL RANGE LR22 AT MAXIMUM FREQUENCY f_{1max} WITHIN FIRST FREQUENCY RANGE ~~RF1~~ FR1 AND MINIMUM FREQUENCY f_{2min} WITHIN SECOND FREQUENCY RANGE ~~RF2~~ FR2 BASED ON DATA REPRESENTING THE RELATIONSHIP
S110
CALCULATE APPROXIMATE FUNCTION AF92a OF RELATIONSHIP OF IFAGC REGISTER VALUES TO RESPECTIVE INPUTTED SIGNAL LEVELS WITHIN LEVEL RANGE LR21 AT MAXIMUM FREQUENCY f_{2max} WITHIN SECOND FREQUENCY RANGE ~~RF2~~ FR2 BASED ON DATA REPRESENTING THE RELATIONSHIP
S111
CALCULATE APPROXIMATE FUNCTION AF92b OF RELATIONSHIP OF RFAGC REGISTER VALUES TO RESPECTIVE INPUTTED SIGNAL LEVELS WITHIN LEVEL RANGE LR22 AT MAXIMUM FREQUENCY f_{2max} WITHIN SECOND FREQUENCY RANGE ~~RF2~~ FR2 BASED ON DATA REPRESENTING THE RELATIONSHIP
S112
GENERATE DISPLAY CONTROL PROGRAM (Fig.25) INCLUDING THE CALCULATED APPROXIMATE FUNCTIONS AF81a, AF81b, AF82a=AF91a, AF82b=AF~~82~~b, AF92a, AND AF92b, AND WRITE THE GENERATED PROGRAM IN PROGRAM MEMORY 51 OF CONTROLLER 50
END
91